Workshop Agenda

1:00-1:10	**Check-in**
1:10-1:15	**Welcome (Mr. Ted Mason)**
1:15-1:30	**NASA Applied Science Program Overview (Dr. Teresa Fryberger)**
1:30-2:30	**NASA SSC Coastal Activities (Mr. Mark Glorioso)**
	NASA SSC Coastal Initiative Coastal Online Assessment and Synthesis Tool (COAST) Completed Projects Current Projects DEVELOP ROSES-08
2:30-3:00	**Introduction of Coastal Strategic Plan (Mr. Mark Glorioso)**
3:00-3:30	**COAST Demonstration (Mr. Richard Brown)**
3:30-3:45	**Break**
3:45-4:45	**Panel Discussion: (Moderator: Mr. Mark Glorioso)**
	Best methods to develop partnerships that enhance the transition from coastal research to operations
4:45- 5:00	**Wrap up (Mr. Mark Glorioso)**

GOMAP

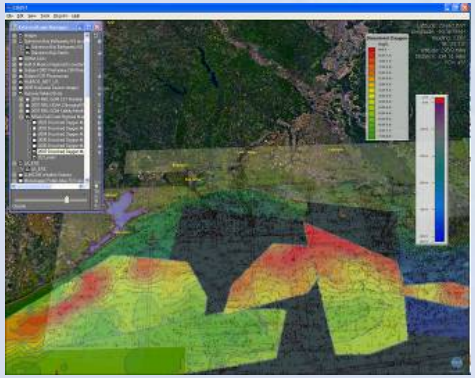
Panel Questions

- Discuss a successful collaboration that resulted in adding an operational product.
  - What are the criteria for adding an operational product? (Local/State/Fed)
  - How long does it really take to transition research to operations?
- What are the barriers that the research and operational partner need to consider when transitioning a research application project?
- Internal to your organization, what is the long-term view of regionalization and how does it affect partnerships?
- What are the major barriers to implementing Remote Sensing prototype products for state and local agencies?
- How important is it at the federal, state, and local perspective to link climate change and climate variability to projects proposed for the GOM?
- Discuss the best methods to publicize successes in partnership relationships and applications.

COAST:
Coastal Online Assessment and Synthesis Tool

***Purpose*: Integration and visual analysis of coastal Gulf of Mexico datasets** **_End-User_: Coastal interest community**

The Coastal Online Assessment and Synthesis Tool (COAST) geobrowser is being developed at NASA Stennis Space Center (SSC) to integrate previously disparate coastal data sets from NASA and other sources into a common desktop client tool that will provide insightful new data visualization and analysis capabilities for coastal researchers, managers, and residents. COAST enhances the capabilities of the immensely successful NASA open source 3D geobrowser, World Wind, developed at the NASA Ames Research Center.



Benefits Of An Open Source GeoBrowser …

- *Free – core development is already paid for*
- *Extensible – install or develop functions that add value to you*
- *Worldwide developer community – new tools and support*

Why is it different?

- *Integrate your own data with other data sources and visualize the results*
- *Fuse different data types, such as spatial and spectral, for simultaneous visual analysis*
- *Visualize temporal changes in areas of interest*

Availability: Initial beta testing and first generation refinements are complete!

COAST 1.0.0 is available for download via the NASA SSC Coastal Program website, www.coastal.ssc.nasa.gov

Project Leads: Craig Peterson (NASA, Stennis Space Center), Ted Mason (NASA Stennis Space Center), and Richard Brown (SSAI, Stennis Space Center)

GOMAP

Completed NASA SSC Gulf of Mexico Application Projects

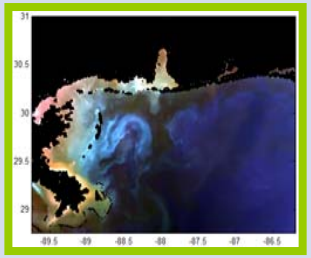
Regional Sediment Management

Purpose:
Detect Suspended Sediments Using MODIS and VIIRS Simulated Data

End User:
U.S. Army Corp. of Engineers

Study Area:
Alabama, Mississippi, Louisiana

Project Leads:
Jean Ellis (NASA)
Maria Kalcic (SSAI)



Suspended Sediments Map

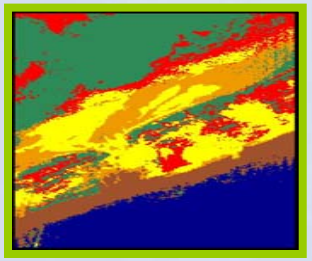
Coral Reef Early Warning System

Purpose:
Determine if NASA Next Generation Sensors can produce Key Data Layers for the NOAA CREWS Decision Support Tool

End User: NOAA

Study Area:
Looe Key, FL; Kaneohe Bay, HI

Project Leads:
Callie Hall (NASA), Lee Estep (SSAI)



Benthic Classification Map

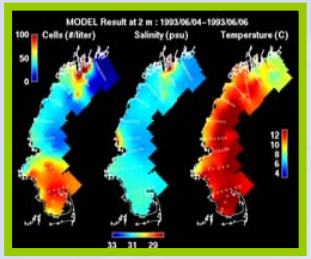
Harmful Algal Bloom

Purpose:
Identify Current and Future NASA Data Products that can be used in the NOAA HABMAPS Decision Support System

End User: NOAA

Study Area: Gulf of Mexico

Project Leads: Callie Hall (NASA), Lee Estep (SSAI)



HAB Forecast Map

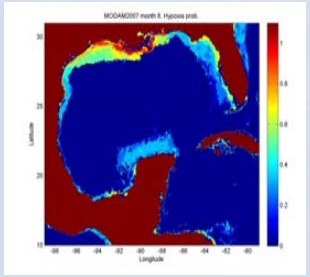
Hypoxia

Purpose:
Predict the Spread of Hypoxia using MODIS Data and the Time Series Product Toolkit

Potential End User:
Regional Planners

Study Area: *Gulf of Mexico*

Project Leads:
Callie Hall (NASA), Bruce Spiering (NASA), Maria Kalcic (SSAI)

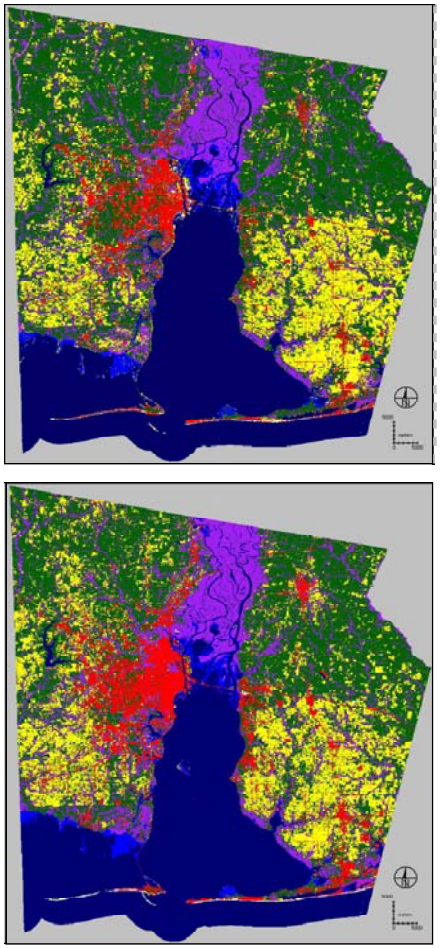


Hypoxia Probabilities Map

GOMAP

Gulf of Mexico Alliance Application Pilot: Land-Use and Land-Cover (LULC) Change from 1974–2008 around Mobile Bay, AL

***Purpose*: Assess LULC changes of Mobile and Baldwin counties, AL, for 1974–2008** ***End-User*: Mobile Bay NEP**



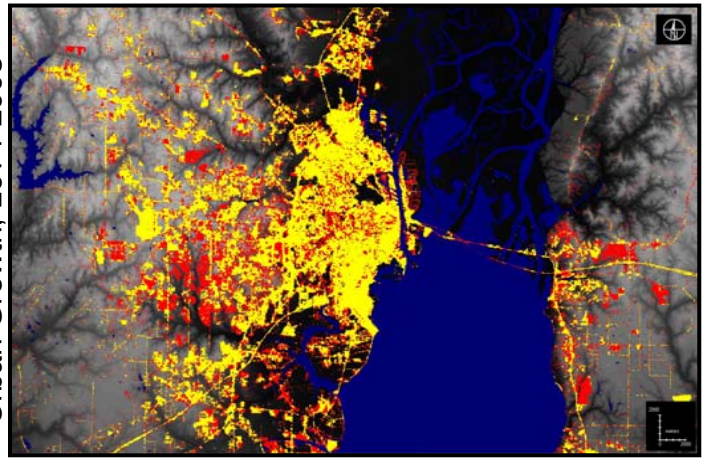
(Top) Landsat MSS (11/12/1974); (Bottom) Landsat TM (3/16/08)

Landsat-derived geospatial statistics to analyze LULC in Mobile and Baldwin counties have been calculated for nine dates between 1974–2008. Project data and data products are tailored for Mobile Bay NEP and will be available on-line [Regional Ecosystem Data Management (NOAA/NCDDC)].

Class	1974 Total Acres	1974 Percent	2008 Total Acres	2008 Percent
Open water	485,302	26.4	504,431	27.2
Barren	3,504	0.2	7,954	0.4
Agriculture	272,024	14.8	284,436	15.3
Non-woody wetland	38,631	2.1	39,964	2.2
Upland forest	674,298	36.6	586,523	31.6
Woody wetland	270,618	14.7	282,213	15.2
Urban	96,688	5.3	151,644	8.2
Total	1,841,065	100.0	1,857,165	100.0

Landsat-derived LULC change statistics from 1974-2008.

Urban Growth, 1974-2008



Yellow: 1974 and 2008 urban extent (Landsat MSS, 11/12/1974); Red: Urban growth from 1974 to 2008 (Landsat TM, 3/16/08); Backdrop: USGS DEM, darker grey shades indicate lower elevations

GOMAP

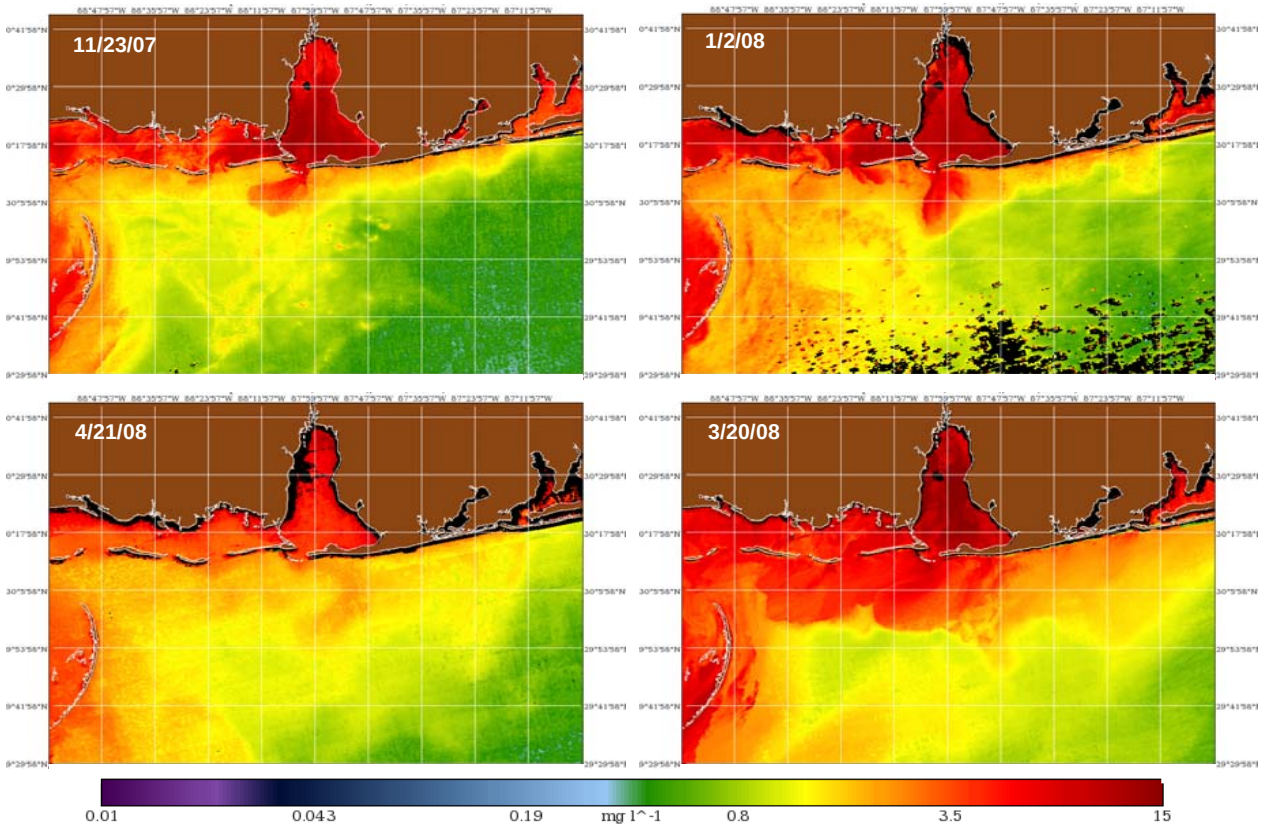
Project Leads: Jean Ellis (NASA, Stennis Space Center) and Joseph Spruce (SSAI, Stennis Space Center)

Satellite Estimation of Suspended Particulate Loads in and around Mobile Bay, AL

***Purpose*: Examine spatial and temporal variability of the Mobile Bay sediment plume**

The variability of the Mobile Bay sediment plume, which impacts water clarity, dissolved oxygen levels, and ultimately seagrass health, will be tracked using MODIS (250 m) and in situ measurements from 10/1/07 to 9/30/08. Total suspended solids are partitioned into organic and inorganic content. Plume area will be delineated and a time-series analysis will be produced.

Total Suspended Solids (organic and inorganic particulates, mg/l)

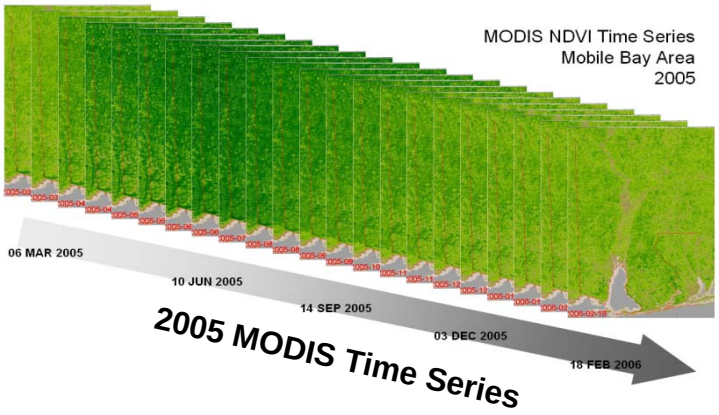


Project Leads: Jean Ellis (NASA, Stennis Space Center), Richard Gould and Gina Smith (Naval Research Laboratory, Stennis Space Center)

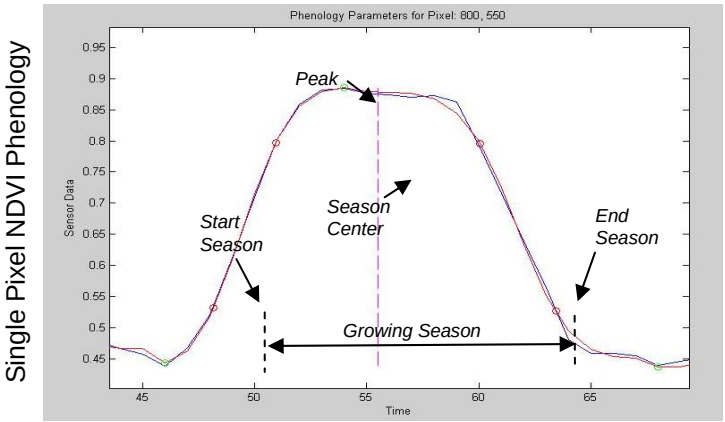
GOMAP

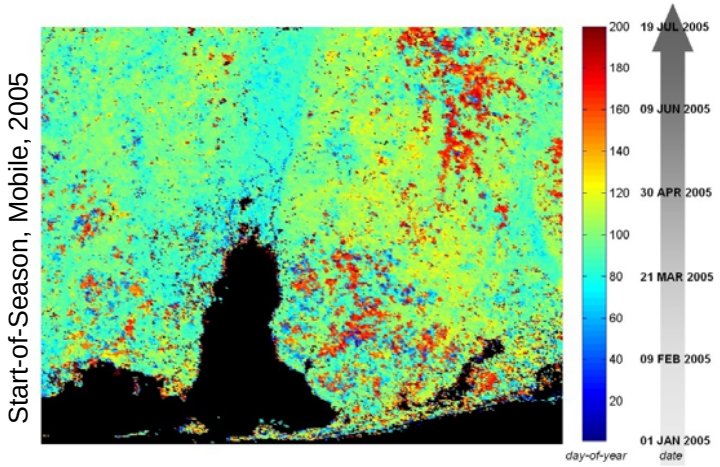
Estimating Relative Nutrient Contributions of Agriculture and Forests Using MODIS Time Series

***Purpose*: Demonstrate viability of nutrient source products for small to medium watersheds around Gulf of Mexico**
***End-User*: MDEQ, potentially other state environmental agencies**



Around the Gulf of Mexico, high-input crops in several regions make a significant contribution to nutrient loading of small to medium estuaries and the near-shore Gulf. In addition to crops, management of timberlands in proximity to the coasts also plays a role. Nutrient source information products can be derived from remotely sensed time series data. Conceptually, these products are intended to complement estuarine nutrient monitoring.





Project Leads: Bruce Spiering (NASA, Stennis Space Center) and Kenton Ross (SSAI, Stennis Space Center)

GOMAP

Use of NASA Satellite Data in Monitoring Gulf Coast Forest Conditions

Purpose: **Assess potential of Gulf Coast forest monitoring products derived from NASA satellite data**
End User**: USDA Forest Service, USGS NWRC, and the LA-DNR**

Regional monitoring of forest damage from hurricanes

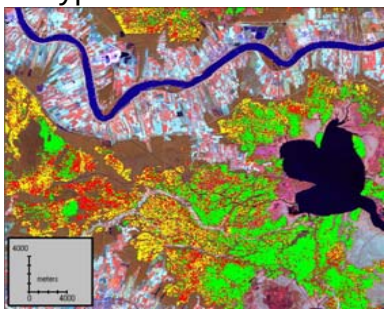
Stand-specific monitoring of baldcypress forest

Study areas – coastal Mississippi and Louisiana

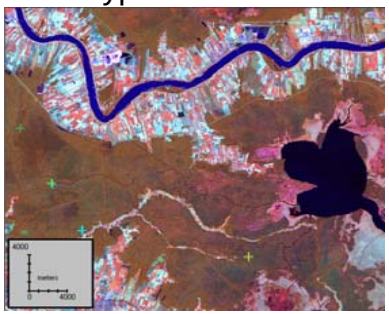
Status – developed and began to assess preliminary products

- Baldcypress stand condition products from Landsat and ASTER data
- Hurricane Katrina forest damage products from MODIS data

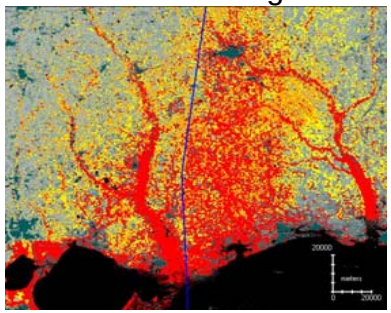
Landsat
Cypress Classification



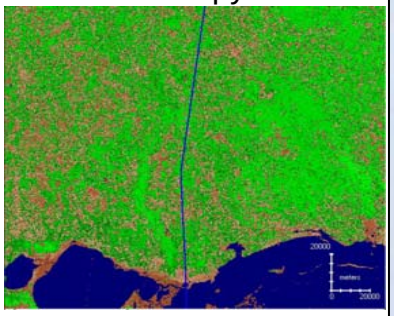
Reference
Cypress Points



MODIS-Based
Forest Damage



NLCD
% Tree Canopy Cover



GOMAP

Project Leads: Joseph Spruce (SSAI, Stennis Space Center) and Duane Armstrong (NASA, Stennis Space Center)

Coastal Marsh Monitoring for Persistent Saltwater Intrusion

***Purpose*: Assess the feasibility of using NASA satellite data to monitor persistent saltwater intrusion in coastal marshes**
***End User*: USGS National Wetlands Research Center and Louisiana Department of Natural Resources**

Approach: Use time series of vegetation indices to identify stressed vegetation (NDVI), moisture indices to determine if persistent flooding is cause of stress (NDMI, NDWI), and CDOM absorption to determine flood water salinity (a_g – salinity relationship)

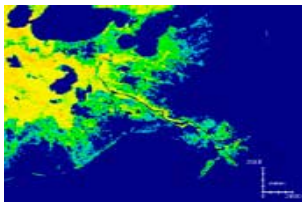
- Sensors: MODIS, Landsat, Hyperion, ALI, ASTER
- Tools: Time Series Product Tool (TSPT)

Study Area: Sabine-Calcasieu River Basin (Louisiana)

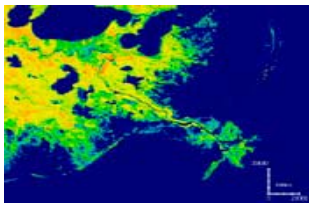
Decision Support: Coast-Wide Reference Monitoring System (CRMS) created by Louisiana Coastal Wetlands Conservation & Restoration Task Force

- Determine effectiveness of Breaux Act restoration projects by providing reference sites for which no paired reference areas exist
- Ensure strategic coastal plan for Louisiana is effective in re-creating sustainable coastal ecosystem

Selected Accomplishments: Analyzed NDVI, NDMI, NDWI time series (2004–2006) of study area; isolated storm surge events and time-shifts in output indices and implemented user-defined region-of-interest selection with TSPT; validated satellite data products with extensive in situ data from CRMS monitoring sites; preliminary generation of additional indicators based on multiple time series variables.



Cumulative NDVI Integral 2004



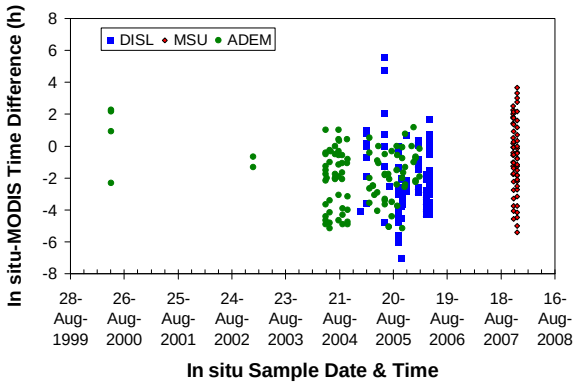
Cumulative NDVI Integral 2006

Project Leads: Callie Hall (NASA, Stennis Space Center), Maria Kalcic and Lee Estep (SSAI, Stennis Space Center), Greg Steyer and John Burras (USGS)

GOMAP

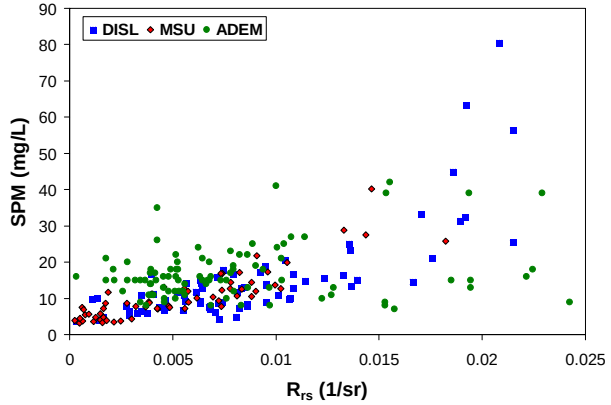
A Standardized Remote Sensing Product for Water Clarity Estimation within Gulf of Mexico Coastal Waters

***Purpose*: Develop a standard remote sensing data product for total suspended sediment**
***End User*: Gulf of Mexico Alliance Nutrients and Water Quality Priority Issue Team**



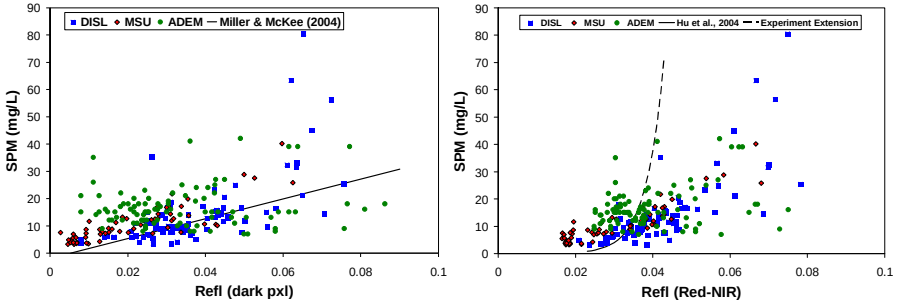
In situ data from 2002 to 2007: Total suspended sediment (TSS) suspended particulate matter (SPM) Secchi disk depths.

Data courtesy of:
MSU, DISL-MSU-NASA, and Alabama Department of Environmental Management (ADEM). Additional data (not shown) has been provided by University of South Mississippi (USM) and Louisiana Department of Environmental Quality (LDEQ).
Additional data are welcome!



Obtained and atmospherically corrected MODIS data that was temporally and spatially concurrent to the in situ measurements. Mobile Bay data shown here.

Tested the correspondence between published algorithms and our data. Mobile Bay data are shown here.



Project Leads: Jean Ellis and Callie Hall (NASA, Stennis Space Center), Slawomir Blonski and DeNeice Guest (SSAI, Stennis Space Center)

GOMAP

NASA ROSES-2008 A.28 Solicitation

A.28 EARTH SCIENCE FOR DECISION MAKING: GULF OF MEXICO REGION
Proposals are due September 30, 2008. **Encourage the pursuit of appropriate partnerships with the emerging commercial space sector**.

Overview
NASA solicits proposals that develop and demonstrate innovative and practicable applications of NASA Earth science observations, models, and research to support resource management, planning, and decision making activities in the Gulf of Mexico Region.

Total Amount of Funding	**$8M total**
Deadline	**9/30/2008**
Anticipated Number of Awards	**10–25 projects**
Expected Range of Award per Project	**$150K – $400K total**
Period of Performance	**up to 24 months**
Expected Project Start Date	**circa January 1, 2009**

Partner in-kind contributions strongly encouraged. However, partner funding does not count toward funding level guidelines.

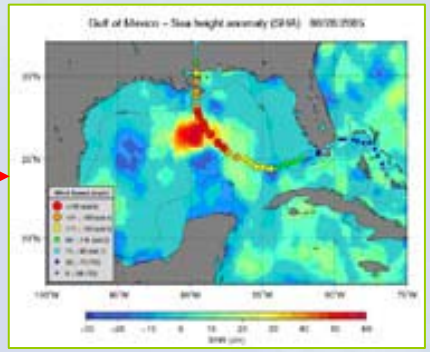
ROSES Solicitations Online:
http://nspires.nasaprs.com/external/

GOMAP

Current Missions:
Direct Coastal Applications

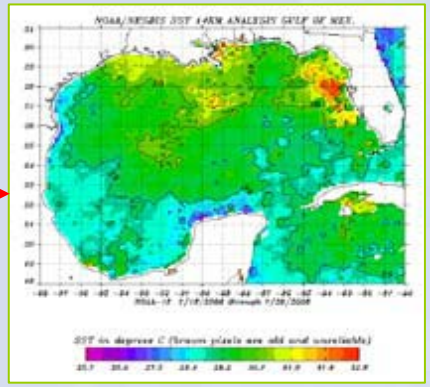
Jason-1 and Jason-2

- Ocean Surface Topography
- Sea Surface Height Anomalies
- Ocean Circulation
- Wave Heights
- Wind Speed



Terra and Aqua

- Colored Dissolved Organic Matter (MODIS)
- Algal Blooms (MODIS)
- Sea Surface Temperature (MODIS/AMSR-E)
- Ocean Surface Roughness (AMSR-E)

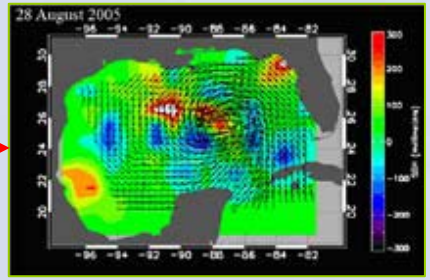


GRACE

- Ocean Circulation

QuikSCAT

- Wind Speed and Direction Over Oceans



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Missions In Development: Direct Coastal Applications

- **Aquarius**
  - Sea Surface Salinity
  - Surface Roughness

- **NPP (VIIRS)**
  - Algal Blooms
  - Surface Temperature
  - Colored Dissolved Organic Matter
  - Suspended Matter

Decadal Survey Missions: Direct Coastal Applications

- **SMAP** (Soil Moisture Active Passive)
  - Algal Blooms
  - Waterborne Infectious Disease
  - Surface Water and Ocean Topography

← **2010-13**

- **SWOT** (Surface Water/Ocean Topography)
  - Ocean Circulation
  - Algal Blooms
  - Waterborne Infectious Disease
  - Surface Water and Ocean Topography
- **GEO-CAPE** (Geostationary Coastal and Air Pollution Events)
  - Coastal Water Quality
  - Algal Blooms
  - Waterborne Infectious Disease
- **ACE** (Aerosol/Cloud/Ecosystem)
  - Algal Blooms
  - Waterborne Infectious Disease

2013-16

- **PATH** (Precipitation and All-weather Temperature and Humidity)
  - Algal Blooms
  - Waterborne Infectious Disease
- **GRACE II**
  - Ocean Circulation
  - Sea Surface Height

2016-20

GOMAP